

# SWING TRAINER

## DESCRIPTION

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### BACKGROUND OF THE INVENTION

#### *Field of the Invention*

10 The present invention generally relates to handle attachments for use with a weight stack or resistance machine which allow the user to train muscle groups in the same manner that they will be used when performing a swinging motion with a piece of sporting equipment.

#### *Description of the Related Art*

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Resistance training machines typically include a stack of weights that are moved, against the force of gravity, by a user in a repetitive fashion using a handlebar or handle assembly. A number of resistance training machines include cables and pulley assemblies, and the user holds and manipulates a handle connected to the cable in order to lift one or more weights in a stack. Bowflex® is a resistance training machine which provides resistance in a progressively increasing fashion by the user causing plastic and/or metal rods to bend under a pulling or pushing force applied through a pulley and cable arrangement. With these resistance machines, a myriad of different exercises can be performed. One of the drawbacks of previous resistance machines is that they generally confine the user's movements to specific planes or arcs, which is not how person would normally use his or her muscles when playing a sport. Freemotion® has addressed this issue with a line of equipment which permits a user to move in any

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direction when pulling on a handle using his or hands or feet.

To date, no devices have been made which effectively take advantage of the resistance machines ability to provide variable and/or increasing resistance, and allow for movement specific resistance training. It would ideal, for example, for a user to  
5 selectively train the muscles used in a golf swing or those used for swinging a baseball bat, but to not introduce resistance which would train muscles not used in those swings, as these may create unnecessary work for the user or, worse, introduce movements that are ultimately detrimental to the swing. Even though most cable crossover machines that have adjustable pulleys on swivels allow a user to change the plane of movement,  
10 attachment of sports specific attachments (e.g., baseball bats, golf clubs, etc.) to these machines or to rubber tubing has not been successful because it changes the sequential firing of the muscle groups or over loads the muscle groups called upon to perform the exact desirable (muscle memory) technique.

Swing training devices, for stick type sporting equipment (e.g., golf clubs,  
15 baseball bats, etc.) which are connected to elastomeric materials, where resistance is applied in increasing quantities, tend to introduce resistance not found in the ordinary swing. In particular, they do not allow for free rotation about the longitudinal axis of the handle, thereby causing additional muscle effort when turning the handle. Similar problems are found in devices where a single connection of cabling from a weight stack  
20 or resistance device to the handle is used. In these devices, right and left shifting of the handle, as would occur in a golf swing take away and follow through for example, would not result in even application of the applied resistance across the length of the handle, thus requiring the user to compensate for changes in resistance which occur when a user is swinging the device.

25 When the top of a bat or golf club is attached to a cable crossover resistance device, or even when such sports specific equipment is attached at one point, and the other end is attached to a secure point, the user's sequential muscle activity will not be the

same as it is when performing the movement with the normal piece of equipment. Also, the user will be using additional or extra muscle contractions because of the single attachment method. For example, if the golf club is attached at the top, once the resistance starts and the user moves from one position to the next, as for example when starting a swing, the wrist and forearm muscles are being over worked and the user's technique is being forced to change because of it. Moreover, other muscles may also be being over worked while others are being left out.

### SUMMARY OF THE INVENTION

It is an object of this invention to provide a handle assembly which allows for movement specific resistance training in a muscle memory fashion.

It is another object of this invention to provide a handle assembly in the form of a sport specific ball, such as a football or bowling ball, for example, that is used for movement specific resistance training in a muscle memory fashion.

According to the invention, the swing trainer includes a handle which preferably is part of a piece of sporting equipment such as a golf club, baseball or softball bat, tennis racket, hockey stick, etc. For example, the handle may include a golf grip, or the handle might be a complete baseball or softball bat. The handle will have a cord, such as rope, cable, rubber or plastic cording, connected at two spaced apart locations. In order to precisely mimic the motions required in a variety of sports, the points of connection will permit the handle to be rotated about its longitudinal axis. For example, a cable may be fitted to a washer assembly that is located within the handle, where the washer holds the cable to the handle, but the handle and washer are permitted to rotate freely relative to one another. Universal joints or other connectors may also be used in the practice of the invention. In a baseball bat, hockey stick or tennis racket configuration, one of the ends of the cord will preferably be secured in the middle of the bat, stick or racket while the

other will preferably be secured at an end of the bat, stick or racket. In this configuration, a member which encircles the bat, stick or racket will be used to connect the end of the cord to the middle of the bat, stick or racket, and the bat, stick or racket, will be free to rotate about its longitudinal axis within the internal circumference of the member.

5           The invention also contemplates a ball device being connected to a resistance based machine, where the ball is freely rotatable about an axis and is shiftable and moveable in any plane. For example, a football member or bowling ball would connected to a cable of a resistance based machine via a swivel or universal joint spaced away from the football or bowling ball. In this way, the football or bowling ball could be moved  
10       freely in the same manner that one uses these devices when playing sports. Furthermore, it may be advantageous to have two connection points similar to the swing trainer handle with a cable running through a pulley, as this would also permit unobstructed rotation and movement of the ball.

          The design of this invention will allow for movement specific motions such as the  
15       golf swing, baseball swing, tennis stroke, throwing a football which start at different positions and heights, and require take-off, rotation/torque, wrist cock, wrist snap and wrist rollover at the proper time so that the user can start and finish at the proper point (e.g., follow through). The invention reinforces the sequential timing of the muscle, and dictates use of only the muscles that are called upon in the sports specific movement in  
20       the same manner as though the user was actually performing with normal sporting equipment. The invention allows resistance training in muscle memory fashion and the resistance can be increased without changing the user's technique. The combination of pulleys, swivels, and rotary elements permit the handle or ball attachment to spin on any axis, go end-over-end, or left and right, simultaneously if necessary, with next to zero  
25       friction or binding.

## BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of the preferred embodiments of the invention with reference to the drawings, in which:

FIG. 1 is a schematic drawing of a swing training device having particular application to the golf swing according to the invention;

FIG. 1A is a schematic of one example of a connector which may be used in the practice of this invention;

FIG. 2A-C are sequential views illustrating movements between different positions of a golf swing as an exemplary use of the handle attachment of this invention;

FIG. 3 is a schematic view of a baseball bat handle attachment according to this invention;

FIGs. 4 and 5 are schematic views of an alternative baseball or softball bat attachment according to this invention;

FIG. 6 is a schematic view of a tennis racket attachment according to this invention; and

FIG. 7 is a schematic view of a football attachment according to this invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

Referring now to the drawings, FIG 1 shows a golf club handle 10 having a cord 12 connected at either end. The cord 12 passes through a pulley 14 which is connectable to a weight stack or other resistance based machine (e.g., the BowFlex® machine). The material used for the cord 12 can vary widely and may include rope, plastic or rubberized material, wire or metal cabling, etc. The chief requirement is that the cord 12 slides

within the pulley 14 as the user shifts his or her hands when the handle 10 is moved in the manner that a golf club would move during a swing (this being indicated by double headed arrow 15), and that the cord 12 be long enough to allow the handle 10 to shift left and right, and up and down as would be done when performing a golf swing. Ideally, a protective sheath 16 of plastic, cloth, tape, or other suitable material would be positioned on the cord 12, at least at the locations closer to the ends of the handle 10 so as to provide the user with some protection from irritation by the cord 12 should it touch the user's skin (this may occur if the user is resistance training the golf follow through). The pulley 14 will have a connector 16 that connects to the cabling system of a weight stack or resistance based machine. Typically, the connector 16 will be a simple eye hole which is connected by a metal clip. However, in some instances the connector might best be of the swivel variety which will allow the pulley 14 to rotate with respect to an axis through the connector 16, as is indicated by the double headed arrow 18. This permits end-over-end movement. Another key feature of the invention is that the points of connection of the cord 12 to the handle 10 permit the handle 10 to rotate about its longitudinal axis as indicated by double headed arrow 20. FIG. 1A shows one example of one type of connection which can accomplish this wherein a washer 22 type connector is positioned within the handle 10 and is permitted to rotate radially therein. The cord 12 would be anchored to the handle 10 by the washer 12, type connector, but the handle 10 would be able to rotate relative to the cord 12 without binding. Some more advanced jump ropes have suitable types of connectors which may be used in the practice of this invention. The types of connectors which might be used are wide ranging.

As can be seen from FIG. 1, the important features of the invention are that the cord 12 translates back and forth through the pulley 14, and the handle 10 rotates freely about its longitudinal axis. Thus, for example and with reference to FIG. 2A-C, when a user is training muscles for the golf swing, the pulley 14 would be connected to a weight stack or resistance device 24. In the take away position of FIG. 2A, the user's hands

would be rotated relative to the contact position shown in FIG. 2B and the follow through position shown in FIG. 2C. Free rotation about the longitudinal axis of the handle 10 permits this change in orientation of the user's hands without contributing undue resistance. In the take away position of FIG. 2A, the user's hands are permitted to turn and cock. By contrast, in the contact position of FIG. 2B the user's hands must release. Furthermore, when training the follow through as shown in FIG. 2C, the user's hands must turn over and twist. Each of these motions must be accomplished without adding undue resistance to the user's wrists or hands. Having the cord 12 translate through the pulley 14 as shown by double headed arrow 15 in FIG. 1, permits this rotation, turning, shifting, and cocking to occur in the same manner as would occur in a golf swing. The translation 15 occurs because the handle 10 is anchored at its top and bottom points as discussed above. Thus, when the hands are shifted right or left, the cord 12 translates through the pulley to allow the top or bottom of the handle to be relatively closer to the pulley 14. Then, when the reverse motion occurs, the cord 12 returns to its point of origin. Repetitive motions like this under the influence of a weight stack or other resistance machine provides movement specific resistance training in a muscle memory fashion. In most applications, the user would position himself or herself so as to apply resistance when moving the hands from the position in FIG. 2A to the position in FIG. 2B, or vice versa, or when moving the hands from the position in FIG. 2B to the position in FIG. 2C, or vice versa. However, one could use resistance training for the entire golf swing by having the resistance applied at a point as shown in FIG. 2A and then having the user move his or hands through the position shown in FIG. 2B to the position shown in FIG. 2C.

The invention can be applied to a wide variety of different stick based sports devices. For example, FIG. 3 illustrates the base end of a baseball or softball bat 26 which would be configured almost identical to the golf grip handle 10 of FIG. 1. The invention might also be used with tennis rackets (as shown in FIG. 5), hockey sticks, etc.

FIG. 4 and FIG. 5 illustrate an alternative embodiment which may be employed with a baseball or softball bat 28. In this instance, the cord 12 is connected to the top of the bat 28 and to a ring shaped member 30 which encircles the bat 28. As discussed previously, the cord 12 passes through a pulley 14. As illustrated in FIG. 4 and FIG. 5, the ring shaped member 30 may be positioned at a different relative distance from the top of the bat 28 depending on the type of swing (e.g., baseball swings are typically different from softball swings), as well on the size and swing preference of the user. The ring shaped member 30 would permit the bat 28 to rotate within the inner circumference, thus permitting the bat 28 to rotate about its longitudinal axis. The ring 30 could be held in place on the bat 28 by controlling the ring size, or by using guides (not shown) positioned on the bat 28 which prevents transverse movement along the length of the bat 28. The cord 12 would translate through the pulley 14 in the same manner as discussed above.

FIG. 6 shows an embodiment with a tennis racket 32 where a ring member 30 encircles the handle 34 and the cord 12 connects to the top of the racket 32 and to the ring member 30. Depending on the needs of the stroke (e.g., ground stroke, overhand, volley, etc.), the ring member 30 may connect at different locations on a shaft 36.

FIG. 7 shows an embodiment of the invention where the handle is in the shape of a football 38. Similar configurations may be made with a bowling ball, softball, baseball, or other ball type device. These would provide for rotation about the axis of the football 38, as well as permit free movement, shifting and turning of the football 38 (as would be the case when one cocks their hand to throw the ball). For example, the nose may be pointed downward in the cocked position, but would be freely moveable to point upward in a release position. Furthermore, during this movement, the ball would be able to rotate about its longitudinal axis as would be the case during a normal throwing motion. While FIG. 7 shows a cord connected at two points, as discussed above, the cord 12 in this instance may only be connected at one point 40 to the end of the ball, provided the point of connection is spaced far enough away (e.g., preferably 3-6 inches) from the end of the



ball to permit its translation up, down, left, and right or in any other direction. This could be accomplished using a swivel or universal type connector at point 40.

While the invention has been described in terms of its preferred embodiments, those of skill in the art will recognize that the invention can be practiced with  
5 considerable variation within the spirit and scope of the appended claims.